Comparison of analytical methods for RGB data of photographs for vegitation survey of terrestiral ecosystems on Antarctica

Akiko Mizuno[1], Takeshi Inoue[2] and Yukiko Tanabe[2]
[1]*ISEE, Nagoya University*
[2]*NIPR*

The quadrat method has been widely used in vegetation monitoring. The method is performed to set some quadrats in a field and survey plants in the quadrat with investigator's naked eyes. Then the method need monetary cost and human resources. Recently, an approaches analyzing photographs of the investigation object taken by compact digital camera as one of the remote sensing techniques is increasingly attempt to diminish the costs of vegetation monitoring (Richardson 2007). And the method is applied to communities constructed by extremely small plants such as mosses, cyanobacteria and lichens. For example, the method of species identified from photographs of moss is deveropled by Takeshi et al. (2017) using deep learning method.

We attempt to develop and compare two analytical methods of RGB data of photographs for vegetation survey of small plants. The permanent quadrat for vegetation survey has been set and kept since 1984 in the Antarctic Specially Protected Area No. 141 and taken photographs each quadrats by Japanese Antarctic Research Expedition since 1988. The permanent quadrats for vegetation survey set up around Yukidori-valley near Showa station on the north-east Antarctica and was chosen places growing mosses, cyanobacteria and lichens in the area.

We applied two methods of image processing to photographs of lichen dominated and moss dominated quadrat for each. The methods are pixel based analysis (PBA) and object based analysis (OBA). In PBA, the photographs is analyzed with RGB value of each pixels. In contrast, the photographs in OBA is firstry segmentazed to regions what have similar color and then classified for each the regions. The two methods has been compared in various analysis object and in analysis purpose (Blaschke 2010). Then, we compared two methods in the two images and discussed.

References

Richardson AD, Hollinger DY, Dail DB, Lee JT, Munger JW, O'Keefe J. Influence of spring phenology on seasonal and annual carbon balance in two contrasting New England forests. Tree Physiol. 29(3): 321-331, 2009.

Blaschke T, Object based image analysis for remote sensing, ISPRS Journal of Photogrammetry and Remote Sensing, 65, 2–16, 2010

Ise T, Minagawa M, Onishi M, Identifying 3 moss species by deep learning, using the" chopped picture" method,arXiv preprint arXiv:1708.01986. 2017

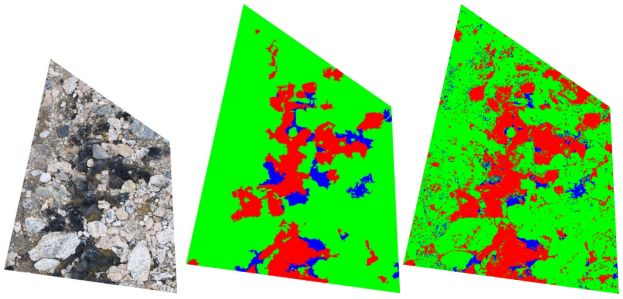

Fig. 1 Image analysis of moss dominated quadrat. Left image is original image, and middle image is manual discrimination and right image is discrimination of with pixel-based analysis.